Volunteer Lake Assessment Program Individual Lake Reports

BRADLEY LAKE, ANDOVER, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	2,624	**Max. Depth (m):**	20.1	**Flushing Rate (yr^{-1})**	1.4
Surface Area (Ac.):	169	**Mean Depth (m):**	6.1	**P Retention Coef:**	0.58
Shore Length (m):	4,500	**Volume (m^3):**	4,174,000	**Elevation (ft):**	828

TROPHIC CLASSIFICATION

Year	Trophic class
1993	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

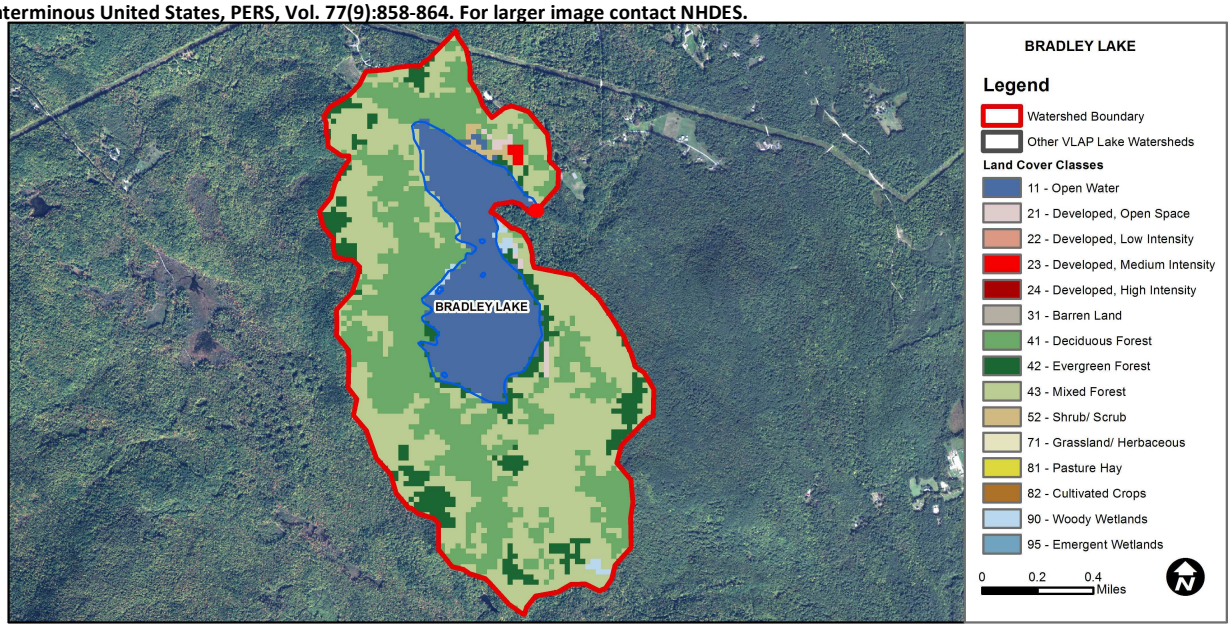
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

BRADLEY LAKE - CAMP MARLYN BEACH	Escherichia coli	No Data	No data for this parameter.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	17.1	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	0.51	Deciduous Forest	32.58	Pasture Hay	0
Developed-Low Intensity	0	Evergreen Forest	8.36	Cultivated Crops	0
Developed-Medium Intensity	0.23	Mixed Forest	40.26	Woody Wetlands	0.62
Developed-High Intensity	0	Shrub-Scrub	0.46	Emergent Wetlands	0

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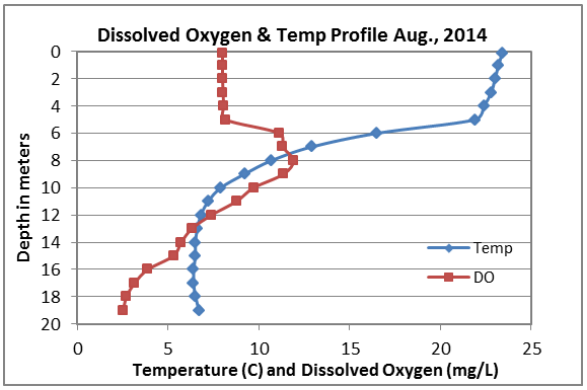
2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels remained fairly stable from June through August and were much less than the state median. Visual inspection of historical data indicates stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot conductivity levels were stable throughout the summer, very low for NH lakes, and much less than the state median. Visual inspection of historical data indicates stable epilimnetic (upper water layer) conductivity since monitoring began.
- **Total Phosphorus:** Deep spot phosphorus levels ranged between non-detectable levels and < 5 ug/L which are much lower than average, much less than the state median, and indicative of good water quality. Visual inspection of historical data indicates stable epilimnetic phosphorus since monitoring began. Inlet phosphorus was slightly above average in June and turbidity was also slightly above average. Laboratory notes indicate sediment in the sample which likely led to the above average phosphorus. Outlet phosphorus remained low throughout the summer.
- **Transparency:** Transparency measured without the viewscope (NVS) decreased slightly as the summer progressed but was much better than the state median. Transparency measured with the viewscope (VS) was generally much better than without and likely a better representation of lake clarity. Visual inspection of historical data indicates stable transparency since monitoring began.
- **Turbidity:** Deep spot turbidity was low on all sampling events. Inlet turbidity was slightly elevated in June due to sediment in the sample, otherwise turbidity was low. Outlet turbidity was within a normal range for that station.
- **pH:** Deep spot and Inlet pH levels were less than the desirable range of 6.5—8.0 units and could become critical to aquatic life. Visual inspection of historical data indicates variable epilimnetic pH since monitoring began.
- **Dissolved Oxygen/Temp:** Dissolved oxygen levels were good through much of the water column and started to decline towards the lake bottom. This is not uncommon by August as decomposition in lake sediments uses up oxygen and the hypolimnetic (lower water layer) waters are not re-oxygenated during the summer months. Dissolved oxygen levels spiked in the Metalimnion (middle water layer) indicating a layer of algae at those depths.
- **Recommended Actions:** Maintain the current monitoring program to develop a comprehensive water quality data set to assess seasonal and historical water quality trends. Water quality data for the lake are within good to excellent ranges and representative of Oligotrophic conditions. The increased frequency and intensity of storm events highlights the importance of minimizing the impacts of stormwater runoff from dirt/gravel roads and shorefront properties. The DES "Homeowner's Guide to Stormwater Management" is a great resource. Keep up the great work!



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)

E. coli: > 88 cts/100 mL – public beach

E. coli: > 406 cts/100 mL – surface waters

Turbidity: > 10 NTU above natural level

pH: between 6.5-8.0 (unless naturally occurring)

Station Name	Table 1. 2014 Average Water Quality Data for BRADLEY LAKE								
	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	2.57	2.08	3	16.3	4	4.66	5.82	0.55	6.35
Metalimnion				17.0	4			0.71	6.37
Hypolimnion				16.4	4			0.68	6.46
Inlet				19.8	10			0.96	6.37
Outlet				16.8	6			1.01	6.36

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.

Alkalinity: 4.9 mg/L

Chlorophyll-a: 4.58 mg/m^3

Conductivity: 40.0 uS/cm

Chloride: 4 mg/L

Total Phosphorus: 12 ug/L

Transparency: 3.2 m

pH: 6.6

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
pH (epilimnion)	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.